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Approved For Release 2002/01/29 : CIA-RDP78T02095R000800040026-0 -2408

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21 July 1967

MEMORANDUM FOR: Acting Chief, FE/DDP
SUBJECT : Estimates of the Infiltration of Supplies
and Personnel to North Vietnam

Attached is our response to your questions relating
to enemy logistics in the war in Vietnam.

25X1A

[REDACTED]
Chief, Trade and Services Division

Distribution: (S-2408)

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(21 July 67)

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GROUP 1
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Infiltration of Personnel and Supplies into South Vietnam

I. Supplies

1. The major entry routes from North Vietnam into Laos for trucks carrying supplies into the Panhandle are now the Mu Gia Pass primarily and Route 137/912 secondarily. The road system is supplemented by portering on trails and by river transportation on the Se Bang Hieng from North Vietnam and by river transportation on the Se Kong from Cambodia.
2. The overall volume of supplies delivered into the Panhandle on these routes from North Vietnam and on the Se Kong from Cambodia during the 1966-67 dry season probably exceeds the volume estimated to have been delivered during the 1965-66 dry season. Some movement of supplies will continue during the 1967 rainy season. We cannot estimate with confidence the total delivered January to June 1967, because of the lack of observations on Route 137/912. But taking into account all available data, and the known improvements in the road system, and truck sightings we estimate, after allowing for losses in transit and for the requirements of the Communists in Laos, that during the year beginning 1 October 1966 an average of over 40 tons a day will have been made available for stockpiling in southern Laos or for subsequent delivery to the Communists in South Vietnam. Over 30 of the 40 tons will have moved from North Vietnam and the other 10 tons will have moved through Laos from Cambodia.

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on the Se Kong and Route 110.

3. We estimate that most of the Class II, IV and V supplies required by the Communist forces in South Vietnam from external sources are delivered from North Vietnam through Laos. The tonnage received by the Communists in South Vietnam from Cambodia through Laos is mainly rice. (See paragraph 7. below, for the estimate of logistic requirements of the Communist forces in South Vietnam.)

4. It is not possible to estimate the volume of supplies moved across the DMZ in 1967. We do estimate that in 1966 the Communists obtained at least 3,000 tons of rice from North Vietnam for use in the DMZ area. Some of this rice may have entered Quang Tri from the trails through Laos. In addition, NVA forces in Quang Tri are almost exclusively dependent on external sources for supplies other than food. VC forces in Quang Tri depend on external sources to some extent also. The frequent movement of NVA forces in Quang Tri province back and forth across the DMZ makes it impossible, however, to make a firm estimate of the total logistical movements across the DMZ.

5. Attempts to infiltrate supplies by sea have continued during January through June 1967, but we do not have adequate intelligence to assign quantities to the amount that may have been infiltrated successfully. Supplies infiltrated by sea probably consist mainly of weapons and ammunition and some medicine. The total

volume infiltrated by sea is estimated to be small, however, compared with the Communist requirements for supplies from external sources.

6. We do not have an estimate of the total volume of supplies delivered directly from Cambodia into South Vietnam in the first half of 1967. In 1966 shipments of rice from Cambodia to Communist forces in South Vietnam and Laos amounted to at least 20,000 tons. Of this amount about 5,000 tons probably were delivered on the Se Kong into Laos some portion of which subsequently moved to South Vietnam. We estimate that an average of 25 tons a day may be delivered to Laos on this route during this year of which an average of 10 tons moves to South Vietnam. Deliveries of rice on other routes directly into South Vietnam during 1967 appears to have decreased, however. This conclusion is based on the lack of reporting of the type received in 1966 regarding shipments and official sales, the scarcity of rice in Cambodia, and the effort made this year by the Cambodian government to control rice sales and to stop rice smuggling. Deliveries of other types of supplies -- consisting mainly of goods that can be purchased on the open market -- may have increased this year, but the overall volume remains small compared to the quantity needed by the Communists.

7. As the following tabulation indicates, in mid-1967 about one-fourth of the daily supply requirements for NVA and VC regular and administrative support forces in South Vietnam was drawn from

sources outside of South Vietnam (in short tons):

	<u>Total</u>	<u>External</u>
I (Food)	162	36
II and IV (Weapons, Quartermaster, Engineer, Medical, Signal, Chemical, etc.)	20	6
III (POL)	Negl.	Negl.
V (Ammunition)	10	9
Total	<u>192</u>	<u>51</u>

There is a growing dependence on external sources for supplies, including food. This is partly the result of the growing proportion of North Vietnamese forces in South Vietnam, especially since they are generally deployed in food deficit areas, and partly because of Allied denial efforts. VC guerrilla forces may require a very small amount of external supplies, principally ammunition, but the bulk of their supplies is obtained almost exclusively from local sources within South Vietnam.

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II. Personnel Infiltration

1. USMACV estimates of NVA infiltration are given below.

	<u>Accepted</u>	<u>Possible</u>	<u>Total</u>
1965	25,800	9,000	34,800
1966	53,500	28,500	82,000
1967			
Jan	600	1,400	2,000
Feb	1,200	900	2,100
March	2,300	5,500	7,800
April	500	300	800
May	500	---	500
June	---	---	---
	<u>5,100</u>	<u>8,100</u>	<u>13,200</u>

2. The above MACV estimates of NVA infiltration for the period January through June 1967 do not accurately reflect the number of troops that have actually infiltrated into South Vietnam. There are other gross indications that the number of troops infiltrated was much higher.

3. The above estimates are incomplete because of the time that elapses between the date a NVA group infiltrates and the date it is "discovered" to the satisfaction of MACV. For example, the following data illustrates changes in MACV reporting of January-June 1966 NVA infiltration.

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<u>Date of Estimate</u>	<u>Total Infiltration</u>
July 1966	32,675
October 1966	53,302
December 1966	54,587
June 1967	54,400

As can be seen from the above, MACV's infiltration estimates require a number of months to "firm up." This time lag -- about 3 months in the above example -- has not remained the same since 1966. The increasing share of replacement and filler troops in total infiltration makes rapid identification more difficult and has caused the current detection period to extend beyond six months in many cases. Indeed, changes are still being made in 1965 infiltration totals.

4. Of the 13,200 infiltrators carried by MACV for the first half of 1967, 7,000 are believed to have crossed the DMZ. Nearly all of the remainder traveled through Laos. A very small number of VIP infiltrators enter South Vietnam by sea infiltration from North Vietnam or third countries.

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*Supplement
to*

S-2408

26 July 1967

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MEMORANDUM FOR: [REDACTED]

SUBJECT : Additional Information on the Infiltration of
Supplies and Personnel to South Vietnam

Attached is the additional information on the Communist
logistical system in the Laos Panhandle that we have prepared
at your request.

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[REDACTED]
[REDACTED]
Chief, Trade and Services Division

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Supplement to Project S-2408

Estimate of the Infiltration of Supplies and Personnel to South Vietnam1. Capacities of the LOC's

During the past year the Communists have generally maintained or slightly improved the overall capacity of the road network that is used for logistic support of the Communist forces in South Vietnam. During recent months they have also built a significant extension to the network that now permits truck traffic to cross the border directly from Laos into South Vietnam for the first time. The capacity of the routes to deliver supplies to forward areas along the Laotian border continues to be restricted by capacities in Laos, rather than those in North Vietnam.

Table 1 shows the change in the estimated capacities of the major routes in southern North Vietnam and the Laotian Corridor. Capacities of the routes in the southern part of North Vietnam have been increased due to new construction of bypasses and use of multiple facilities such as highway ferries, fords, and pontoon bridges. Capacities of the two major routes to the DMZ - Routes 1A and 101 - have not changed greatly, but capacities of the routes leading to the Laotian Corridor have increased considerable. Route 15 to Mu Gia Pass appears to have been improved to the extent that the capacity is now estimated at 740 short tons a day in the dry season and 250 tons a day in the rainy season compared with an estimate

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of 450/100 tons a day nearly a year ago. Route 137, the other road leading to the Laotian Corridor, is also believed to have been improved slightly, from 450/100 tons to 500/100 tons.

Capacities of Laotian roads leading from these border crossings have not been maintained quite as well as they were last year, although these capacities still far exceed the average level of traffic observed moving over the routes. The dry season capacity of Route 12 leading from Mu Gia Pass is now estimated to be about one-fourth less than it was earlier and Route 23 capacity is possibly about 40 percent less. The reduced quality of these roads may be the combined result of bombing and of greater rain fall than usual during the dry season in the Mu Gia Pass area on the Laotian side of Annam Mountains. Route 912 leading from the other border crossing still has a capacity of about 200/40.

Dry season capacities of routes further south in the Corridor are more or less the same as they were last year, and it is estimated that the routes continue to have the capacity to support at least 400 tons a day to the ends of the routes in the border area. Half of this total can be moved into South Vietnam on Route 922 which now extends about 35 miles from the border into the A Shau valley.

Through capacities of the Laotian routes south of Route 9 during the rainy season are now estimated to be zero for truck

traffic based on the experience of the past rainy season. Actual capacities, however, will depend on the measures that Communists take to maintain traffic. Last year they made no apparent effort to keep the roads open for truck traffic during the rainy season.

2. Utilization of the Route Capacity and Traffic Density

The level of traffic observed moving on the routes is low compared with the capacity of the routes, and the number of trucks compared with the mileage of routes used is also low. These factors have made aerial interdiction of the truck supply route exceeding difficult.

A comparison of the capacity of Route 15 (740 tons/day during the dry season) at Mu Gia with the estimated tonnage moved on the route (19 trucks carrying 57 tons/day) during the past dry season reveals that on the average only about 8 percent of the route capacity has been utilized. If all of this tonnage was moved south in Laos on Route 12 where the route capacity is estimated to be 350 tons per day in the dry season, about 16 percent of the capacity was used on the average. Even smaller portions of the capacity of routes further south appeared to be used as the trucks fanned out over various routes from the junction of Routes 12 and 23.

It is estimated that the Communists utilized between 400 and 600 trucks on the approximately 700 miles of roads that they control in the Panhandle. Thus they are using less than one

truck per mile of roads. Although certain roads are used more than others, thus creating traffic densities higher than the average, the most frequently used roads do not carry a significantly high density of traffic. Route 12 can be used as an example. Assuming that 19 trucks per day moved south and 19 trucks moved north each day during the past dry season, about 38 trucks a day would have moved over the route. Most of these trucks moved in hours of darkness, or in about 12 hours. Thus ^{an average of} only about 3 trucks per hour moved past any one point on the road.

Other factors making aerial interdiction of the route and trucks difficult are the simplicity of the network (e.g., no big bridges, dirt roads that are easily repaired after attack) and the preparation of alternate routes, bypasses, turnouts, and truck parks. Alignment of the roads was selected in areas that afford maximum concealment from the ~~air~~ as well as best conditions for road maintenance.

3. Tonnage Delivered into Laos from North Vietnam and Cambodia During 1966-67

Table 2 presents the basic computation of the total tonnage made available in Laos by traffic via all routes during the year beginning 1 October 1966. Details of the assumptions and methodology are explained in footnotes and expanded in the following section.

4. Methodology

a. Route 15

Data on Route 15 is based on reports of ground observers,

primarily roadwatch teams, of trucks observed moving south into Laos. The total number of trucks reported moving south from 1 October 1966 to 15 June 1967 of 3,039 was divided by the number of days of observation (161 days) to obtain an average number of trucks moving daily of 19.* Each truck was estimated to have carried 3 tons, so 57 tons (before losses) or 46 tons (after losses) could have been moved into Laos each day. It was assumed that approximately the same number of trucks carrying the same tonnage would have moved daily during the days when no observations were made. The length of the dry season was assumed to be 1 October 1966 - 15 June 1967 or 258 days so the total estimated tonnage carried into Laos during the dry season was (258 x 46 =) 11,868 tons. (See Table 4 for additional details).

b. Routes 137 and 912

The estimation of the tonnage moved over Route 912 into Laos was made by assuming that Route 137 was used to the same proportion of its capacity by trucks entering Laos as Route 15 was used to its capacity. The capacity of Route 137 was estimated** to have been 500 tons a day, while that of Route 15 was estimated to have been 740 tons a day, or about 167 and 247 trucks a day respectively. An average of about 19 trucks a day were reportedly observed by ground observers on Route 15, equal to about 8 percent of its estimated

* Details are shown in Table 3, below.

** See Table 1.

capacity. Eight percent of the estimated capacity of Route 137 would be about 40 tons (or 13 trucks per day). This figure would give a total after losses of 8,256 tons for a dry season of 258 days.

c. DMZ and Trails

There is no program set up to watch movements over trails, such as those around the DMZ. Taking into account reports of defectors, returnees, and prisoners, it has been estimated that about 10 tons a day could be moved over trails into Laos during a dry season of about 210 days, and 5 tons a day during the rest of the year.

d. Route 110

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Communist transpor-

tation along Route 110, has stated that 40 tons of supplies a day were moved into Laos. It is assumed that this tonnage was moved only during the dry season of about half the year. [REDACTED]

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[REDACTED] other sources of information it is estimated that bicycles moved about 10 tons a day during the rainy season in the other half of the year. These figures would give a total of about 9,100 tons a day delivered the year around or about 25 tons on a daily basis.

e. Losses

A factor of 20 percent has been deducted for normal losses in transit, spoilage, waste, and losses due to air attacks. Very little detailed information has been reported on this subject, thus this factor is arbitrary, but it is assumed that on the average throughout the year this factor is reasonable.

5. Size of Trucks and Types of Cargo Carried by Trucks

For purposes of estimating tonnage carried by trucks into Laos, it has been assumed that each truck carried an average load of three tons. This assumption is based on reports of roadwatch teams that have stated that large-size trucks moved over various roads in the Panhandle*, the Communist practice to utilize to the fullest the capacity of transport vehicles (so they would probably over-load rather than under-load their trucks), and the slow speeds at which the trucks move that would compensate for poor roads. (Roads in the Panhandle area, however, appear to be relatively well maintained compared with other roads in S.E. Asia.)

Only scant information is available on the types of supplies moved into Laos. Most trucks entering Laos are canvas covered and travel at night, so roadwatch teams are unable, in most cases, to see what the trucks carry. A very small percent of the total number of trucks has been observed carrying gasoline drums, and empty drums have been heard on trucks moving north. It is estimated, based on information regarding Communist requirements in Laos and South Vietnam, that supplies from North Vietnam consist mostly of ammunition, weapons (including antiaircraft), engineering and quartermaster equipment, gasoline for the trucks used in Laos, and some medical supplies and food.

* This seems to be at least partially confirmed by a recent analysis of aerial photography.

Supplies entering Laos over the Se Kong and Route 110 are reported to be mostly food, but some medical supplies and petroleum are also reported.

6. Comparison with Dry Season 1965-66

A comparison of the estimated tonnage that moved into Laos over Route 15 during the 1965-66 dry season and the present dry season is shown in Table 4. The totals estimated are 16,300 and 11,900 tons respectively. In addition to Route 15, however, it is known that Route 912 was also used as a supply route during the 1966-67 dry season, and it is estimated that about 8,300 tons were moved into Laos over this route from North Vietnam. Thus, the total moved by truck into Laos/from North Vietnam during the 1966-67 dry season was over 20,000 tons compared with about 16,000 tons during the previous dry season.

7. Expectations for Rainy Season, 1967

No estimates have been included in the above calculations for truck traffic entering Laos from North Vietnam during the rainy season, although it is known that a small number of trucks entered Laos during past rainy seasons. It is apparent from recent reports from roadwatchers that traffic will continue during the present rainy season. The level of this traffic may be considerably higher this year than during past years, but at the present time the overall volume of supplies delivered by this traffic cannot be estimated.

8. Road Construction

The motorable road system in the Laos Panhandle which is presently controlled by Communist forces has been significantly expanded since 1964. The following tabulation shows the existing road mileage in 1964 and the subsequent annual additions which the Communists have completed along the main axis from Mu Gia Pass to the Cambodian border:

<u>Year</u>	<u>Statute Miles</u>
1964	208 (existing)
1965	136 { }
1966	304 (additions)
1967	53 { }
Total	<u>701</u>

The extensive expansion of the road system in 1965-66 afforded the Communists a choice of alternate and new routes which extended the motorable road system to the Cambodian border. In 1967, less new road construction was undertaken. However, many short bypasses were constructed along existing routes. These short bypasses are not included in the above figures.

The most significant new road construction in 1967 was the extension of route 922 eastward to connect a motorable road from Laos into the A Shau Valley of South Vietnam. Most of the remaining east-west roads end before reaching the South Vietnam border and cross into South Vietnam only as foot paths and cart trails. It

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is estimated that over 260 miles of such trails are in use at the motorable terminii of roads in the Laos Panhandle.

Most of the road network is single lane unimproved earth surface which has been constructed and maintained by an estimated PL/NVA work force of 15,000 men. Some portions of the road system have been upgraded to all-weather status by means of corduroy on swampy sections, gravel or oil surfacing and drainage systems. These efforts have proven effective on short segments of key routes but the entire road system through the Laos Panhandle has not been kept serviceable throughout the past rainy seasons.

9. Methodology

The road mileage figures have been derived from roads which have been observed in available aerial photography in a given year, and represent a minimum estimate of the extent of the motorable route system in the Laos Panhandle. For the most part, roads reported by guerrilla or road-watch teams have been verified by aerial photography. There could be other motorable roads in the Panhandle, however, which have not been observed by any intelligence sources.

The estimated trail mileage which is an integral part of the infiltration network along the Laos/South Vietnam border is also based on available aerial photography and represents a minimum. Sources of information upon which estimates of the number of repair workers can be made are much less exact. Returnees who have been involved in repair for maintenance are few, but information from

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sources that have been located on routes 92, 96 and 110 have provided a narrow base from which extrapolations have been made to estimate the total number of repair workers on the road system in the Panhandle. Aerial photography of repair work has also helped to support the labor force estimate.

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Table 1

Estimated Capacities of Selected Routes in Southern North Vietnam
and the Laotian Corridor as of 1 August 1966 and 1 May 1967*

Route Number	Dry Season/Wet Season In Short Tons Per Day	
	1 May 1967	1 August 1966
<u>North Vietnam:</u>		
1 A	960/120	900/100
1 5	740/250	450/100
101	610/120	610/120
137	500/100	450/100
<u>Laos:</u>		
12, North of Route 23	350/100	460/90
12, West of Route 23	180/40	270/0
23, North of Route 911	310/0	510/100
92, North of Route 922	310/0	380/80
92, between Routes 96 and 922	310/0	90/0
96, North of Route 165	310/0	310/0
96, South of Route 165	100/0	90/0
110	200/40	110/0
911	550/70	410/0
912	200/40	200/40
914	200/40	200/40
922	200/50	250/50

* Capacity estimates are derived by applying an agreed NATO methodology to characteristics of the route to determine the number of trucks that can move over the road during each 24 hours on a continuous bases and by assuming each truck can carry 3 short tons.

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Table 2

Estimated Quantities of Supplies Delivered to Communist Forces in Laos
Over Main Supply Routes from North Vietnam and Cambodia

Routes	Estimated Number of Trucks Moving	Estimated Tonnage Moved a/ (Tons Per Day)	Estimated Tonnage Delivered b/ (Tons Per Day)	Number of Days of Deliveries c/	Total Tonnage Delivered During Period (Tons)	Estimated Year-Round Average Tonnage Available from Deliveries (Tons Per Day)
15 and 12	19	57	46	258	11,868	33
137 and 912	13 d/	40 d/	32	258	8,256	23
DMZ and Trails	None		10	210	2,100	8
			5	155	755	
110	N.A.	N.A.	40	183	7,320	25
			10	182	1,820	
Total						89

- a. Based on an average load of three tons per truck. For the DMZ area and trails the movement was by porters, pack animals, native craft, and/or bicycles. Figures represent tonnage before deductions for losses.
 b. After deduction of 20 percent for losses due to bombing and wastage.
 c. For each route the top figure indicates number of days in dry season, bottom figure the number in wet season. If only one is shown it is for the dry season and indicates no deliveries were considered for the wet season.
 d. The estimated tonnage moved per day of 40 tons was computed first (see Methodology) and the estimated number of trucks moving per day (13) was then obtained from this figure by dividing it by an average load of 3 tons per truck.

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Table 4

Comparison of Tonnage Entering Laos on Route 15 Only

	Approximately Mid-November 1965 - <u>Mid-June 1966</u>	1 October 1966 <u>15 June 1967</u>
Estimated Number of Trucks	6,776	3,039
Number of Days of Observation	242	161
Average Number of Trucks Per Day (on Days of Observation)	28	19
Average Tonnage per Day Available	84	57
Average Tonnage per Day Delivered (after deducting 20 percent for losses)	67	46
Length of Dry Season (days)	242	258
Estimated Tonnage Carried In During Dry Season (after deductions for losses)	16,261	11,868

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